UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Northwest Region
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Seattle, WA 98115-0070

NMFS Tracking
No. 2003/01201

May 14, 2004

Thomas F. Mueller
Chief, Regulatory Branch
Seattle District
Corps of Engineers
P.O. Box 3755
Seattle, Washington 98124-3755

Re: Endangered Species Act section 7 Formal Consultation and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Consultation for SR 224 Van Giesen Road Stabilization Project, Benton County, Washington, HUC 17030003079, Lower Yakima

Dear Mr. Mueller:

In accordance with section 7 of the Endangered Species Act (ESA) of 1973, as amended, 16 U.S.C. 1536, and the Magnuson-Stevens Fishery Conservation and Management Act (MSA), as amended by the Sustainable Fisheries Act of 1996, 16 U.S.C. 1855, the attached document transmits NOAA's National Marine Fisheries Service (NOAA Fisheries) Biological Opinion (Opinion) and MSA consultation on the proposed SR 224, Van Giesen Road Stabilization Project, Benton County, Washington.

The Corps of Engineers has determined that the proposed action was likely to adversely affect the Middle Columbia River steelhead (*Oncorhynchus mykiss*) Evolutionarily Significant Unit. Formal consultation was initiated on September 17, 2003.

This Opinion reflects formal consultation and an analysis of effects covering listed steelhead in Big Creek, Washington. The Opinion is based on information provided in the biological evaluation received by NOAA on September 17, 2003, subsequent information transmitted by telephone conversations, and mail. A complete administrative record of this consultation is on file at the Washington State Habitat Office.

NOAA Fisheries concludes that the implementation of the proposed project is not likely to jeopardize the continued existence of Middle Columbia River steelhead. Please note that the

incidental take statement, which includes reasonable and prudent measures and terms and conditions, was designed to minimize take.

The MSA consultation concluded that the proposed project may adversely impact designated Essential Fish habitat (EFH) for chinook (*O. tshawytscha*) and coho (*O. kisutch*) salmon. Specific Reasonable and Prudent Measures of the ESA consultation, Terms and Conditions identified therein, would address the negative effects resulting from the proposed COE actions. Therefore, NOAA Fishereis recommends that they be adopted as EFH conservation measures.

If you have any questions, please contact Dennis Carlson of the Washington State Habitat Office at (360) 753-5828 or email at dennis.j.carlson@noaa.gov.

Sincerely,

for Michael R Crouse

D. Robert Lohn
Regional Administrator

Enclosure

Endangered Species Act - Section 7 Consultation

Biological Opinion

and

Magnuson-Stevens Fishery Conservation and Management Act

Essential Fish Habitat Consultation

SR 224 VAN GIESEN ROAD BANK STABILIZATION
Benton County, Washington
(HUC Code 17030003079)

Agency:	U.S. Army Corps of Engineers
Consultation Conducted By:	National Marine Fisheries Service
Date Issued:	May 14, 2004
Issued by:	for Michael R Course

D. Robert Lohn
Regional Administrator

NMFS Tracking No.: 2003/01201

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1.0 INTRODUCTION

This document transmits NOAA's National Marine Fisheries Service (NOAA Fisheries) biological opinion (Opinion) under the Endangered Species Act (ESA) and Essential Fish Habitat (EFH) consultation under the Magnuson-Stevens Fishery Conservation and Management Act (MSA) to the U.S. Army Corps of Engineers for issuance of a Department of the Army permit under section 10 of the Rivers and Harbors Act of 1899 and section 404 of the Clean Water Act. These consultations were based on review of a proposed project to place approximately 1,600 cubic yards of heavy-loose riprap along the north/east bank of the Yakima River, west of Richland, Benton County, Washington. The project will also include construction of four barbs, two by the Washington State Department of Transportation (WSDOT) and two by a private landowner in cooperation with the Benton County Conservation District and the Washington State Department of Fish and Wildlife. The WSDOT barbs will incorporate large woody debris into the design. All areas disturbed by construction activities will be seeded, fertilized, mulched, and/or replanted with native vegetation. The Yakima River is a tributary to the Columbia River, and is in the geographic range of the Middle Columbia River (MCR) evolutionarily significant unit (ESU) for threatened steelhead (*Oncorhynchus mykiss*) and is EFH for chinook (*O. tshawytscha*) and coho (*O. kisutch*) salmon. An ESU is considered a distinct population segment appropriate for protection under the ESA.

1.1 Background Information and Consultation History

Through a full review of field observations, and all other information, WSDOT concluded the proposed project may affect, and is likely to adversely affect the MCR steelhead. It was also determined the project may also adversely affect EFH for the Yakima River chinook and coho salmon.

The U.S. Army Corps of Engineers (COE) submitted a biological assessment (BA) and request for ESA section 7 formal consultation and EFH consultation on July 1, 2002. That BA was subsequently withdrawn by request of WSDOT on September 5, 2002. A revised BA was submitted to NOAA Fisheries on September 17, 2003. In November 2003, NOAA Fisheries requested the COE and/or WSDOT include an addendum to the project description in the BA consistent with the Integrated Streambank Protection Guidance used by the action agencies in designing bank stabilization projects and promoting restoration of riverine functions that favor fish habitat. In March 2004, NOAA Fisheries received a telephone call from the WSDOT Hydrology Section that indicated a detailed river reach analysis is pending for the lower Yakima River (including the project area), but is not a high priority nor is it funded at this time. A detailed river reach analysis may identify measures or actions, other than those included in the proposed action, that are necessary to stabilize the riverbank and restore riverine functions in the lower Yakima River.

1.2 Description of the Proposed Action

The COE proposes to issue a permit to WSDOT for construction to stabilize a section of the Yakima River bank at river mile (RM) 7.8 to 7.9. The Yakima River is presently eroding a bank adjacent to State Route (SR) 224 (Van Geisen Road), a two-lane rural highway that connects the cities of West Richland and Benton City. The project proposed by WSDOT is critical to the success of a riverbank stabilization and riparian habitat restoration project proposed by the Benton County Conservation District and both projects are necessary for the protection of SR 224 and the property of adjacent landowners.

Project work will entail the following: constructing four barbs that will utilize a total of approximately 600 cubic yards of rock of which approximately 300 cubic yards will be placed below the ordinary high water mark (OHWM) of the Yakima River; constructing a rock toe by placing approximately 1,000 cubic yards of heavy loose rip rap of which approximately 325 cubic yards will be placed below the OHWM, and; discharging 1,600 cubic yards of soil landward of the rock toe of which approximately 560 cubic yards will be below the OHWM. The rock toe will incorporate large wood to provide channel complexity and roughness. Revegetation with native plant species will be incorporated into the project from the OHWM landward within the project area.

Construction work will require clearing, excavating, placing riprap, and planting vegetation along approximately 400 linear feet of the Yakima River. Major excavation will be necessary along the riverbank to construct the four barbs. Work at or below the OHWM will be conducted from the bank. The rock toe and barbs will be comprised of heavy loose, clean angular riprap. All riprap will be placed under full suspension with an excavator equipped with a hydraulic thumb.

1.3 Description of the Action Area

Under the ESA, the "action area" is defined as all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action (50 CFR 402.02). For the purposes of this consultation, the action area includes the Yakima River, a quarter of a mile downstream from the work area and extending approximately 50 feet upstream from the structure. The action area also includes the adjacent riparian zone within the construction area and all areas affected by the project including any staging areas and roadways.

2.0 ENDANGERED SPECIES ACT BIOLOGICAL OPINION

The objective of this consultation is to ensure that the agency's proposed action is not likely to jeopardize the continued existence of MCR steelhead ESU. The MCR ESU is a distinct population segment of steelhead salmon, the preservation of which is necessary to maintain genetic diversity of steelhead.

2.1 Evaluating Proposed Actions

The standards for determining jeopardy are set forth in section 7(a)(2) of the ESA and 50 CFR Part 402 (the consultation regulations). NOAA Fisheries must determine whether the action is likely to jeopardize the listed species. This analysis involves the initial steps of (1) defining the biological requirements of the listed species and current status of the listed species, and (2) evaluating the relevance of the environmental baseline to the species' current status.

Subsequently, NOAA Fisheries evaluates whether the action is likely to jeopardize the listed species by determining if the species can be expected to survive with an adequate potential for recovery. In making this determination, NOAA Fisheries considers the estimated level of mortality attributed to: (1) collective effects of the proposed or continuing action, (2) the environmental baseline, and (3) any cumulative effects. This evaluation must take into account measures for survival and recovery specific to the listed salmonid's life stages that occur beyond the action area. If NOAA Fisheries finds that the action is likely to jeopardize, NOAA Fisheries must identify reasonable and prudent alternatives for the action.

Recovery planning will help identify feasible measures that are important in each stage of the salmonid life cycle for conservation and survival within a reasonable time. Without a final Recovery Plan, NOAA Fisheries must ascribe the appropriate significance to actions to the extent available information shows. NOAA Fisheries intends that recovery planning identify areas/stocks that are most critical to species conservation and recovery from which proposed actions can be evaluated for consistency under section 7(a)(2).

2.1.1 Biological Requirements

The first step in the methods NOAA Fisheries uses for applying the ESA Section 7(a)(2) to listed salmon is to define the species' biological requirements that are most relevant to each consultation. NOAA Fisheries also considers the current status of the listed species; taking into account population size, trends, distribution and genetic diversity. To assess the current status of the listed species, NOAA Fisheries starts with the determinations made in its original decision to list the species for protection under the ESA. In addition, the assessment will consider any new information or data that are relevant to the determination.

The relevant biological requirements are those necessary for listed species to survive and recover to naturally reproducing population levels at which time protection under the ESA would be unnecessary. Species or ESUs not requiring ESA protection have the following attributes: population sizes large enough to maintain genetic diversity and heterogeneity, the ability to adapt to and survive environmental variation, and are self-sustaining in the natural environment.

The biological requirements of MCR steelhead include food, flowing water (quantity), high quality water (cool, free of pollutants, high dissolved oxygen concentrations, low sediment content), clean spawning substrate, and unimpeded migratory access to and from spawning and

rearing areas (adapted from Spence *et al.* 1996). The specific biological requirements affected by the proposed action include water quality, food, and unimpeded migratory access.

2.1.2 Environmental Baseline

The environmental baseline represents the current basal set of conditions to which the effects of the proposed action would be added. The term "environmental baseline" means "the past and present impacts of all Federal, state, or private actions and other human activities in the action area, the anticipated impacts of all proposed Federal projects in the action area that have already undergone formal or early section 7 consultation, and the impact of state or private actions which are contemporaneous with the consultation in process" (50 CFR 402.02). The term "action area" is defined as "all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action." The BA identifies the proposed project action area to include all aquatic habitat along the Yakima River from approximately milepost 8.8 to 9.0, approximately eight river miles upstream of the confluence of the Yakima and Columbia rivers. The headwaters of the Yakima River emerge from the crest of the Cascade Mountains above Keechelus Lake. From there, the Yakima River flows approximately 215 miles downstream to Richland, Washington where it enters the Columbia River at river RM 335. The Yakima River drainage area comprises approximately 6,200 square miles. Forest practices, agriculture, urbanization, and floodplain revetments have adversely affected instream flows, water quality, and riparian habitat throughout the Yakima River Basin. Road and railway prisms bracket the river, gravel sources have been mined right up to the river bank, and orchards and other crops are farmed up the river's edge. Because of substantial development and the existence of vital public and federal waterworks in the basin, the Yakima River has been armored and channelized to convey large quantities of water and protect local infrastructure. Presently, floodplain revetments and management scenarios serve to limit interaction between the Yakima River and its floodplain, and severely impact native riparian habitat. In addition, river flow management scenarios have further diminished physical processes that promote regeneration and growth of native riparian vegetation, often promoting the growth of nonnative plant species.

The Yakima Basin occupies two physiographic provinces (the Columbia Plateau and Cascade Mountains), and three major ecoregions (Cascades, Eastern Cascades Slopes and Foothills, and Columbia Basin (Omernik 1987)). Consequently, climate, topography, precipitation, and vegetative cover are highly variable. In addition, the distribution and type of aquatic and terrestrial habitat is quite variable, supporting a wide range of species. With respect to anadromous fishery resources, the Yakima Basin once supported abundant and diverse runs of salmon and steelhead that now return in just a fraction of their historic numbers (Nehlsen *et al*. 1991; Tuck 1995; Busby *et al*. 1996; NMFS 1996).

In the Cascades ecoregion of the watershed, the Yakima River and its tributaries drain predominantly forested, mountainous terrain inhabited by Pacific silver fir, larch, western hemlock, western red cedar, Douglas fir, lodgepole and white pine. At lower elevations in the Cascades and Eastern Cascades ecoregions, the slopes and foothills of the basin are populated by sparse stands of ponderosa pines, deciduous shrubs, and bunch grasses. The arid Columbia

River ecoregion is dominated by shrub-steppe vegetation characterized primarily by sagebrush and dryland bunch grasses. Riparian species change with elevation and precipitation, and include cottonwood, Douglas fir, western hemlock, red cedar, alder, and willow. Wetland areas are vegetated by sedges, rushes, and mannagrass; scrub-shrub wetlands support willow, alder, spirea, cattails and bulrushes.

There are five primary existing water quality problems in the Yakima River that include: altered temperature; pH; instream flows; fecal coliform; and pesticides. The 1998 Statewide Water Quality Assessment 303(d) report (Washington State Department of Ecology (WSDOE 1998) indicates that, upstream of the project area, the Yakima River is "water quality limited", and contains numerous sites listed as 303 (d) stream reaches. That is, the river does not meet state water quality standards (for one or more contaminants), and technology-based controls are not sufficient to achieve those standards. The WSDOE (1997) reported that the Lower Yakima River contains high levels of pesticides. The Yakima River was placed on the 303(d) list because of excessive levels of DDT, Arsenic, Dieldrin, Endosulfan, Fecal Coliform, Mercury, PCBs, silver and suspended solids (Turbidity). Other 303(d) listings include excessive temperatures, low dissolved oxygen, and high pH.

The Yakima Valley has been subjected to extensive use of non-ionic pesticides since the 1950's. Pesticides such as DDT, Dieldrin and Endosulfan are extremely persistent in the environment and have been detected in amounts that exceed water quality criteria. The WSDOE (1997) reported the lower Yakima River contains high levels of pesticides. Total DDT concentrations in smallmouth bass and carp samples exceeded the WSDOE screening guidelines by an order of magnitude. Dieldrin was also found in levels that exceeded the screening guidelines. Concentrations of Dieldrin in excess of 0.7 g/kg is considered detrimental to human health, and both bass and carp exceeded this level in the 1995 sampling.

The Yakima River at the project location has been highly modified from its historical hydrology. Bureau of Reclamation Yakima Project operations, pursuant to delivery of water for irrigation, have greatly impacted biotic and abiotic conditions in the lower Yakima River. Generally, instream flow problems stem from chronically low discharge levels during reservoir refill periods to inordinately high flows out of phase with the ecology of MCR steelhead when downstream demands are being met. The hydrograph of the Yakima River in the action area exhibits diminished precipitation-induced late fall and winter spates, truncated spring runoff peakflows. Hydrograph simplification (*e.g.*, the removal of fall-winter flow spikes, attenuation of peakflows, and stable, high, irrigation flows), as well as flow regulation regimes that are asynchronous with the life-history requirements of native floodplain and aquatic species, has deleteriously altered MCR steelhead habitat throughout the lower Yakima River Basin.

Water quality in the action area can be poor because of irrigation effluents that enter the Yakima River upstream. In most years, irrigation diversions diminish instream flow and contribute to high temperatures that can have a negative impact on native fish populations and produce instream conditions conducive to nonnative predators. Additionally, runoff and/or groundwater recharge may contribute warm water containing toxic constituents. Further, land-use activities

(farming, residential development, roads, and bank armoring, etc.) have altered sediment cycling and nutrient delivery pathways, contributing to a riverscape that differs significantly from natural conditions.

Throughout the action area, riparian habitat has been degraded through a variety of activities. Roads, farms, channel armoring, urban development, and floodplain revetments have reduced or precluded riparian habitat by direct canopy removal, reducing the widths of riparian zones, converting land to commercial or residential uses that preclude plant growth, and altering the plant community structure by planting nonnative vegetation. Within the action area, a dike confines the river channel on the south bank. The dike is maintained by the COE and extends from the Van Giesen Bridge at milepost 8.3, downstream to approximately RM 7.1. For MCR steelhead, the lack of properly functioning riparian habitat contributes to instream temperatures that may exceed physiological tolerances and streambank erosion that increases sedimentation of the riverbed. Additionally, degraded riparian zones contribute an inadequate amount of large wood to the river, and subsequently prevent or inhibit habitat forming processes such as pool formation and the establishment of instream cover. Further, river flow management practices and floodplain infrastructure provide discharge out of phase with the natural hydrograph that is spatially and temporally incompatible with salmonid, riparian, and hyporheic species' requirements.

Based on the above information, NOAA Fisheries concludes that not all of the biological requirements of listed steelhead habitat in general are being met under the environmental baseline in this watershed. The factors for population decline that contribute to the need for listing the MCR ESU as threatened continue to persist in the action area. To improve the status of MCR steelhead, significant improvements in habitat conditions are needed. Improving and restoring floodplain connectivity, restoring distributary channels in alluvial floodplains, restoring riparian vegetation, reducing consumptive water use, eliminating fish passage barriers, and promoting regulated flow regimes that more closely mimic natural runoff conditions and support the ecology of native aquatic species assemblages are items that could enhance salmonid production in the Yakima River Basin.

2.1.2.1 Factors affecting the Species at the Population Scale

For MCR steelhead, NOAA Fisheries assessed life history, habitat and hydrology, hatchery influence, and population trends in analyzing the effects of the underlying action on affected species at the population scale. A thumbnail description of each of these factors for the MCR steelhead ESU is provided below.

2.1.2.1.1 ***Life History***. Most fish in this ESU smolt at two years and spend one to two years in salt water before reentering freshwater, where they may remain up to a year before spawning (Howell *et al.* 1985). All steelhead upstream of The Dalles Dam are summer-run (Schreck *et al.* 1986, Reisenbichler *et al.* 1992, Chapman *et al.* 1994). The Klickitat River, however, produces both summer and winter steelhead, and age-2-ocean steelhead dominate the summer steelhead, whereas most other rivers in the region produce about equal numbers of both age-1- and 2, ocean

fish. A nonanadromous form co-occurs with the anadromous form in this ESU; information suggests that the two forms may not be isolated reproductively, except where barriers are involved.

2.1.2.1.2 Habitat and Hydrology. The reasons for the decline of steelhead in the Yakima River watershed include:

- construction of four dams on the Columbia River downstream of the Yakima River,
- timber practices, degraded riparian and in-stream habitat from urbanization and livestock grazing,
- large irrigation withdrawals,
- poorly screened or unscreened irrigation diversions,
- low in-stream flows reducing rearing habitat and impeding fish passage, and
- high water temperatures.

These conditions are greatly magnified in the lower Yakima River system, creating unfavorable passage for upstream and downstream migrants as well as degraded rearing conditions for juveniles.

2.1.2.1.3 Hatchery Influence. Hatchery management practices are suspected to be a major factor in the decline of this ESU. The genetic contribution of non-indigenous, hatchery stocks may have reduced the fitness of the locally adapted native fish through hybridization and associated reductions in genetic variation or introduction of deleterious (*i.e.*, non-adapted) genes. Hatchery fish can also directly displace natural spawning populations, compete for food resources, or engage in agonistic interactions (Campton and Johnston 1985; Waples 1991; NMFS 1996; 63 Fed. Reg. 11798, March 10, 1998).

***2.1.2.1.4 Population Trends and* Risks**. For the MCR steelhead ESU as a whole, NOAA Fisheries estimates that the median population growth rate (lambda) over the base period[1] ranges from 0.88 to 0.75, decreasing as the effectiveness of hatchery fish spawning in the wild increases compared to that of fish of wild origin (McClure *et al.* 2001). NOAA Fisheries has also estimated the risk of absolute extinction for four of the spawning aggregations, using the same range of assumptions about the relative effectiveness of hatchery fish. At the low end, assuming

[1]Estimates of median population growth rate, risk of extinction, and the likelihood of meeting recovery goals are based on population trends observed during a base period that varies between spawning aggregations. Population trends are projected under the assumption that all conditions will stay the same into the future.

that hatchery fish spawning in the wild have not reproduced (*i.e.*, hatchery effectiveness equals zero), the risk of absolute extinction within 100 years ranges from zero for the Yakima River summer run to 1.00 for the Umatilla River and Deschutes River summer runs (McClure *et al.* 2001).

2.1.2.2 Factors Affecting the Species within the Action Area

Section 4(a)(1) of the ESA and NOAA Fisheries listing regulations (50 CFR 424) set forth procedures for listing species. The Secretary of Commerce must determine, through the regulatory process, if a species is endangered or threatened based upon any one or a combination of the following factors; (1) the present or threatened destruction, modification, or curtailment of its habitat or range; (2) overutilization for commercial, recreational, scientific, or educational purposes; (3) disease or predation; (4) inadequacy of existing regulatory mechanisms; or (5) other natural or human-made factors affecting its continued existence.

The proposed action includes activities that would have some level of effects with short-term impacts from category (1) in the above paragraph, and the potential for long-term impacts as described in category (5). The characterization of these effects and a conclusion relating the effects to the continued existence of MCR steelhead is provided below, in section 2.1.3.

The major factors affecting MCR steelhead within the action area include inadequate instream flows, water quality, and riparian habitat. NOAA Fisheries uses the Matrix of Pathways and Indicators (MPI) to analyze and describe the effects of these factors on listed steelhead.

2.1.3 Status of Species

NOAA Fisheries considers the current status of the listed species by taking into account population size, trends, distribution and genetic diversity. To assess the current status of the listed species, NOAA Fisheries starts with the determinations made in its original decision to list the species for protection under the ESA. In addition, the assessment will consider any new information or data that are relevant to the determination.

The listing status and biological information for NOAA Fisheries listed species that are the subject of this consultation are described below in Table 1.

Species (Biological Reference)	Listing Status Reference	Critical Habitat Reference
Steelhead from Washington, Idaho, Oregon and California, (Busby, *et al.* 1996).	The MCR ESU is listed as Threatened under the ESA by NMFS, (March 25, 1999, 64 FR 14517,).	Not Designated[2]

Table 1. References to Federal Register Notices containing additional information concerning listing status, biological information, and Critical Habitat designations for listed and proposed species considered in this Opinion.

Middle Columbia River steelhead have been negatively affected by a combination of habitat alteration and hatchery management practices. The four downstream, mainstem dams on the Columbia are perhaps the most significant source of habitat degradation for this ESU. The dams act as partial barriers to passage, kill out-migrating smolts in their turbines, raise temperatures throughout the river system, and have created lentic refugia for salmonid predators. In addition to dams, irrigation systems have had a major negative impact by diverting large quantities of water, stranding fish, and acting as barriers to passage. Other major habitat degradation has occurred through urbanization and livestock grazing practices (WDF *et al.* 1993; Busby *et al.* 1996; NMFS 1996; March 10, 1998, 63 FR 11798).

Habitat alterations and differential availability impose an upper limit on the production of naturally spawning populations of salmon. The National Research Council Committee on Protection and Management of Pacific Northwest Anadromous Salmonids identified habitat problems as a primary cause of declines in wild salmon runs (NRCC 1996). Some of the habitat impacts identified were the fragmentation and loss of available spawning and rearing habitat, migration delays, degradation of water quality, removal of riparian vegetation, decline of habitat complexity, alteration of streamflows and streambank and channel morphology, alteration of ambient stream water temperatures, sedimentation, and loss of spawning gravel, pool habitat and large woody debris (NMFS 1998, NRCC 1996, Bishop and Morgan 1996).

Hatchery management practices are suspected to be a major factor in the decline of this ESU. The genetic contribution of non-indigenous, hatchery stocks may have reduced the fitness of the locally adapted native fish through hybridization and associated reductions in genetic variation or introduction of deleterious (non-adapted) genes. Hatchery fish can also directly displace natural spawning populations, compete for food resources, or engage in agonistic interactions (Campton and Johnston 1985; Waples 1991; Hilborn 1992; NMFS 1996; March 10, 1998, 63 FR. 11798).

[2]Under development. On April 30, 2002, the U.S. District Court for the District of Columbia approved a NOAA Fisheries consent decree withdrawing a February 2000 Critical Habitat designation for this and 18 other ESUs.

The MCR steelhead population sizes are substantially lower than historic levels, and at least two extinctions are known to have occurred in the ESU. In larger rivers (John Day, Deschutes, and Yakima), steelhead abundance has been severely reduced: it is estimated that the Yakima River had annual run sizes of 100,000 fish prior to the 1960's; more recently (early 1990's), natural escapement has been about 1,200 fish (WDF *et al.* 1993). Across the entire ESU, the wild fish escapement has averaged 39,000 and total escapement 142,000 (includes hatchery fish). The large proportion of hatchery fish, concurrent with the decline of wild fish, is a major risk to the MCR ESU (WDF *et al.* 1993; Busby *et al.* 1996; March 10, 1998, 63 FR 11798).

Within the Yakima River Basin, adult steelhead returns have averaged 1,256 fish (range 505 (1996) to 2,840 (1988)) over brood years 1985-2000 as monitored at Prosser Dam (RM 47.1) (YSS 2001). Steelhead spawning varies across temporal and spatial scales in the Yakima Basin as well, although the current spatial distribution is significantly decreased from historic conditions. NOAA Fisheries has identified the following spawning populations within the Yakima Basin: upper Yakima River above Ellensburg, Teanaway River, Swauk Creek, Taneum Creek, Roza Canyon, mainstem Yakima River between the Naches River and Roza Dam, Little Naches River, Bumping River, Naches River, Rattlesnake Creek, Toppenish Creek, Marion Drain, and Satus Creek. Typically, steelhead spawn earlier at lower, warmer elevations than higher, colder waters. Overall, most spawning is completed within the months of January through May (Hockersmith *et al.* 1995), although steelhead have been observed spawning in the Teanaway River (RM 176.1), a tributary to the Upper Yakima into July. These steelhead spawn later in the year at higher elevations in the Yakima basin, and face lethal conditions (in most years) as down-migrating kelts (spawned-out adults returning to the ocean) in the lower Yakima River. The MCR steelhead that spawn in the Yakima basin at lower elevations potentially meet the same fate, however earlier spawn timing and emigration may provide increased survival because kelts traverse the lower Yakima River before water quality becomes lethal. High temperatures, low flows, and degraded water quality from irrigation effluents (*i.e.*, high temperature, turbidity and pollutant concentrations), contribute to extremely low survival during summer months (Vaccaro 1986; Lichatowich and Mobrand 1995; Lichatowich *et al.* 1995; Pearsons *et al.* 1996; Lilga 1998).

The upper Yakima steelhead population was undoubtedly adversely affected by operations at Roza Dam (RM 128) between 1941 and 1959. Although fitted with a ladder, the pool at Roza Dam was kept down from the end of one irrigation season (mid-October) to the beginning of the next (mid-March) for these 18 years. Hockersmith *et al.* (1995) found that steelhead passed Roza Dam from November through March, and more recent data suggest that passage occurs from the end of September through May. Consequently, operations at Roza Dam virtually eliminated fish passage for most of the steelhead migration season, and excluded most steelhead bound for the upper Yakima from reaching their destination. A new ladder was installed at Roza Dam in 1989 that allows better passage, but only when the pool is completely up or down. However, the ladder is inoperable at levels between maximum and minimum pool when the reservoir is manipulated to facilitate operational activities such as screen maintenance at the end of October and early November.

Juvenile steelhead utilize tributary and mainstem reaches throughout the Yakima Basin as rearing habitat, until they begin to smolt and emigrate the basin. Smolt emigration begins in November, peaking between mid-April and May. Busack *et al*. (1991) analyzed scale samples from smolts and adult steelhead and found, generally, that smoltification occurs after two years in the Yakima system, with a few fish maturing after three years and an even smaller proportion reaching the smolt stage after one year. When compared to spawning distribution and run timing, these data suggest that various life stages of listed steelhead are present throughout the Yakima Basin and its tributaries virtually every day of the year.

2.2 Effects of the Proposed Action

Because MCR steelhead are present in the action area for much of the year, they are likely to experience effects from the proposed action. Juveniles overwinter in the action area from November through March and smolts migrate through mostly from April through mid June. Adult steelhead migrate through or hold in the action area from October through March. Kelts that are present, migrate mostly from April through mid June. Individual kelts, upstream migrant adults, and smolts are occasionally observed near the action area in the summer months, but high summer water temperatures generally preclude year round use by steelhead.

NOAA Fisheries' ESA implementing regulations define "effects of the action" as "the direct and indirect effects of an action on the species together with the effects of other activities that are interrelated or interdependent with that action, that will be added to the environmental baseline" (50 CFR 402.02).

2.2.1 Direct Effects

Direct effects are the immediate effects of the project on the species or its habitat. Direct effects result from the action and include the effects of interrelated and interdependent actions. Future Federal actions that are not a direct effect of the action under consideration (and not included in the environmental baseline or treated as indirect effects) are not evaluated (USFWS and NMFS 1998).

2.2.1.1 Water Quality

Constructing two J-Hook vanes and two rock barbs along the north/east bank of the Yakima River, clearing, excavating, armoring, and replanting the bank, will mobilize sediments and temporarily increase downstream turbidity levels. Around the construction area (within several hundred feet), the level of turbidity would likely exceed ambient levels by a substantial margin and potentially affect MCR steelhead. Four specific activities will mobilize sediments: clearing vegetation and excavating the riverbank, the placing riprap for toe rock, constructing two J-Hook vanes and two rock barbs in the Yakima River, and, discharging soil behind the toe rock. These activities will deliver short-term (minutes to hours) pulses of sediment downstream. However, the proposed action includes measures and Best Management Practices (BMPs) to decrease the likelihood and extent of any such effect on listed salmonids. Most significantly the in-water

construction will occur between July 1 and September 30 when few if any steelhead will be present because of the aforementioned high water temperatures.

Quantifying turbidity levels, and their effect on fish species, is complicated by several factors. First, turbidity from an activity will typically decrease as distance from the activity increases. How quickly turbidity levels attenuate depends on the quantity of material in suspension (*e.g.*, mass or volume), particle size, the amount and velocity of ambient water (dilution factor), and the physical/chemical properties of the sediments. Second, the impact of turbidity on fish is not only related to the turbidity levels, but also the particle size of the suspended sediments.

For salmonids, turbidity has been linked to a number of behavioral and physiological responses (*i.e.*, gill flaring, coughing, avoidance, increase in blood sugar levels) which indicate some level of stress (Bisson and Bilby 1982; Berg and Northcote 1985; Servizi and Martens 1992). The magnitude of these stress responses are generally higher when turbidity is increased and particle size decreased (Bisson and Bilby 1982; Servizi and Martens 1987; Gregory and Northcote 1993). Although turbidity may cause stress, it has been shown that moderate levels of turbidity (35-150 nephelometric turbidity units [NTUs]) accelerate foraging rates among juvenile chinook salmon, likely because of reduced vulnerability to predators (camouflaging effect).

Increased turbidity will be short-lived and highly localized because of low flow conditions during the proposed work window. The project also includes measures to reduce or avoid turbidity impacts. While steelhead presence will be very low during the in-water portion of the proposed action, any fish in the immediate construction area are likely to avoid or reduce their exposure to turbidity by swimming to adjacent, less turbid habitat. Fish downstream of the in-water construction activity, but within the action area when the effects are manifest, are likely to be able to avoid the area until the turbid conditions dissipate.

The likelihood of other water quality impacts exists. Chemical contaminants from historical pesticide applications could be re-exposed or released to the aquatic habitat during riverbank excavation/construction activities. This could be additive and/or synergistic to the suite of chemical contaminants that placed the Yakima River on the water quality limited 303(d) list.

As with all construction activities that require the use of heavy equipment, accidental release of fuel, oil, and other contaminants might occur. Those contaminants could injure or kill aquatic organisms if spilled into a water body or the adjacent riparian zone. To avoid any such impacts, all equipment fueling and maintenance would occur in designated staging areas 150 feet or more from any water body or wetland, making it unlikely that a petrochemical spill would reach the stream.

2.2.1.2 Streambed and Bank Disturbance

Riverbank clearing and excavation, J-Hook vane and rock barb construction, placement of a rock toe, and the discharge of soil will remove riparian vegetation and disturb soils, riverbank, and channel substrates along approximately 400 linear feet of the Yakima River. Upon work

completion and establishment of a planted riparian zone, the proposed project would increase channel cross sectional flow capacity, reduce flow velocity, and improve riparian habitat while providing a stable slope.

As previously mentioned, in-water work will occur only between July 1 and September 30, both dates inclusive. This limitation or "work window" is designed to reduce the exposure of vulnerable fish life stages to construction impacts. Because the work window for this proposed action allows work when only the MCR steelhead life stages present in the action area should be free-swimming, any fish that are present should be able to evacuate the area when work disturbance is initiated. In addition, WSDOT will be implementing numerous BMPs as outlined in the BA to minimize and reduce effects to listed salmonids.

2.2.2 Indirect Effects

Indirect effects are caused by or result from the proposed action, are later in time, and are reasonably certain to occur. Indirect effects may occur outside of the area directly affected by the action. Indirect effects might include other Federal actions that have not undergone section 7 consultation but will result from the action under consideration. These actions must be reasonably certain to occur, or be a logical extension of the proposed action (50 CFR 402.02).

2.2.2.1 Macroinvertebrate Production

Project construction at and below the OHWM of the Yakima River will cause temporary loss (burial and/or displacement) of macroinvertebrate habitat along approximately 400 feet of riverbank. Aquatic invertebrates provide an important source of prey for juvenile salmonids, and the alteration of their habitat through burial or displacement would reduce foraging opportunities for MCR steelhead. This alteration of foraging opportunity may be long term where nearshore riverbed substrates are displaced by large angular rock or backfill is used to reshape the riverbank. Macroinvertebrates will likely recolonize the interstitial spaces between the angular rock placed to stabilize the bank and the rock used to construct the J-Hook vanes and barbs. The future restoration of the riparian zone will add a long-term organic detritus source of food for macroinvertebrates that provide an important food source for juvenile MCR steelhead.

Foraging opportunities in aquatic habitat adjacent to the work area may be temporarily reduced because of physical disturbance. This loss of foraging opportunity will be short-lived because of transitory work, and invertebrates tend to quickly recolonize disturbed areas (Allan 1995). Where temporarily disturbed, macroinvertebrate recolonization rates in the action area are expected to be rapid because the affected areas are confined along the immediate riverbank for the length of the project. Also, the project work will occur during the summer months when juvenile steelhead will have vacated the action area to avoid high water temperatures, so the temporary reduction in macroinvertebrates will have a minor effect on foraging opportunities.

Turbidity pulses caused by project work will not have a measurable effect on macroinvertebrate production because of the short term required to complete project work, BMPs employed to

minimize turbidity releases, and low flow conditions that will reduce the likelihood of turbidity plumes extending beyond the action area.

2.2.2.2 Riparian and Fisheries Habitat

The construction of J-Hook vanes and rock barbs, placement of riprap for a rock toe slope, and bank slope backfill will cause a short-term loss of riparian function by removing or degrading vegetation. The loss of functions might include shading and organic matter inputs to the stream. Shade helps cool the shallow areas of the river, providing temperatures beneficial to MCR steelhead. Organic input from riparian vegetation is the foundation for the prey-base of MCR steelhead. The riparian zone in the action area has been subject to farming practices and residential development, and supports a significant quantity of nonnative vegetation. Large wood is absent within the action area. However, the bank areas used to key the rock vanes and barbs will be revegetated with a diverse assemblage of species that are native to the project area or region to stabilize soils and help expedite site recovery. The negative effects of these activities on MCR steelhead and aquatic habitat indicators will be limited by implementing construction methods and approaches included in the project design BMPs.

2.2.2.3 Streambank Condition and Floodplain Connectivity

The proposed action continues a trend to artificially harden riverbanks to reduce site erosion and promote the rapid conveyance of high flows through the lower reaches of the Yakima River to the Columbia River. Bank hardening activities in the action area has entrained the river, prevented natural channel meandering and floodplain interaction processes that promote riparian habitat formation, precluded future sources of large wood and detrital inputs, and affect the composition, rate of accretion and scour of riverine substrates. This contributes to or exacerbates already high summer season water temperatures (lack of shade), reduced refugia and foraging habitat for rearing juvenile fish, and reduced fish habitat complexity. NOAA Fisheries expects the placement of rock barbs and J-Hook vanes and the installation of a rock toe slope at or below the OHWM, during high flow or flood events, to transfer the energy of those high flows downstream to neighboring properties. This could exacerbate riverbank erosion of downstream properties not already protected by riparian habitat or other forms of bank stabilization, and result in the perceived need for downstream landowners to install artificial erosion control measures at those locations. If so, constructing additional artificial bank hardening structures could repeat the river channel scenario described above, and continue to prevent or hinder the future attainment of properly functioning aquatic habitat conditions for MCR steelhead.

Bank hardening will likely degrade or eliminate any backwater areas or side channels located within the action area. Those areas are important to juvenile fish, particularly during flood events when fish seek off-channel habitats to avoid high flows. This would reduce or eliminate foraging and refugia habitat available for juvenile salmonids rearing in the project area. The only backwater or off-channel habitat found in the project area are minor bank avulsions that at certain flood flows could provide limited refugia habitat. Thus, the loss of off-channel refugia habitat for juvenile MCR steelhead would be minimal.

2.2.3 Population Scale Effects

As detailed in section 2.1.2.1.4, NOAA Fisheries has estimated the median population growth rate (lambda) for MCR steelhead affected by the proposed project. For the MCR ESU, life history diversity has been limited by the influence of hatchery fish, by physical barriers that prevent migration to historical spawning and/or rearing areas, and by water temperature barriers that influence the timing of emergence, juvenile growth rates, or the timing of upstream or downstream migration. In addition, hydropower development has profoundly altered the riverine environment and those habitats vital to the survival and recovery of the MCR ESU.

The construction of the rock vanes and barbs, installing bank protection, and backfilling with soil will effect MCR steelhead. The stated conservation measures and BMPs will reduce the potential for harm to listed fish from increased turbidity, riverbank alteration, vegetation removal, and riverbed disturbance. The negative short-term effects are increased turbidity and vegetation removal. Long-term negative effects of the proposed action are bank armoring and riverbed alteration. Riparian habitat restoration will stabilize soils in the action area and provide future shade and organic inputs to the river. The rock vanes and barbs may provide eddys and limited refugia habitat for juvenile MCR steelhead.

2.3 Cumulative Effects

Cumulative effects are defined as "those effects of future state or private activities, not involving federal activities, that are reasonably certain to occur within the action area of Federal action subject to consultation" (50 CFR 402.02). Future Federal actions that are unrelated to the proposed actions are not considered in this section because they require separate consultation pursuant to section 7 of the ESA.

In the action area for this project, agricultural activities are the main land use. Riparian buffers are not properly functioning, containing little native woody vegetation. Although land use practices that would result in take of endangered species are prohibited by section 9 of the ESA, such actions do occur. NOAA Fisheries cannot conclude with certainty that any particular riparian habitat will be modified to such an extent that take will occur. Riparian habitat is essential to salmonids in providing and maintaining various stream characteristics such as channel stabilization and morphology, leaf litter, and shade. However, given the patterns of riparian development in the Lower Yakima River Basin and the rapid human population growth in Benton County, it is reasonably certain that some riparian habitat will be impacted in the future by non-Federal activities. Conversely, many of the agricultural landowners in the watershed are participating in cooperative, voluntary programs to improve riparian conditions of their lands.

The mainstem Yakima River and other Yakima Basin tributaries are generally overappropriated. This condition is unlikely to worsen as the state of Washington continues to clarify water rights through the adjudication process. Furthermore, the state is engaged, through the Departments of Ecology and Fish and Wildlife, and the Benton County Conservation District, in programs to

improve instream flows in the Lower Yakima River and its tributaries. If successful, such programs may improve water quality and quantity and riparian habitat in the lower Yakima Basin.

2.4 Conclusion/Opinion

NOAA Fisheries has reviewed the direct, and indirect, effects of the proposed action on listed species and their habitat. NOAA Fisheries evaluated these effects in light of existing conditions in the action area, anticipated cumulative effects, and measures outside of the Action Area to improve or restore MCR habitat. While the proposed action is likely to cause short- and long-term adverse effects on listed salmonids by modifying habitat, these effects are unlikely to reduce salmonid distribution, reproduction, or numbers in any meaningful way. The long-term project effect is expected to improve riparian habitat conditions in the action area that could benefit fish rearing conditions by providing shade and organic inputs. Consequently, the proposed action is not likely to jeopardize the continued existence of listed MCR steelhead.

2.5 Reinitiation of Consultation

This concludes formal consultation for the SR 224, Van Giesen Road Bank Stabilization Project. Consultation must be reinitiated if: (1) the amount or extent of taking specified in the Incidental take Statement is exceeded, or is expected to be exceeded; (2) new information reveals effects of the action may affect listed species in a way not previously considered; (3) the action is modified in a way that causes an effect on listed species that was not previously considered; or (4) a new species is listed (50 CFR 402.16). To reinitiate consultation, the COE should contact the Habitat Conservation Division (Washington State Habitat Office) of NOAA Fisheries. Upon reinitiation, the protection provided by this incidental take statement, section 7(o)(2), becomes invalid.

For this consultation, if the COE fails to implement any of the BMPs or conservation measures described as part of the project, or exceeds the described amount of habitat impact, or the action will affect MCR steelhead in a way that is not considered in this Opinion, then reinitiation of consultation will be required.

2.6 Incidental Take Statement

The ESA at section 9 (16 U.S.C. 1538) prohibits take of endangered species. The prohibition of take is extended to threatened anadromous salmonids by section 4(d) rule (50 CFR 223.203). Take is defined by statute as to "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct" (16 U.S.C. 1532(19)). Harm is defined by regulation as "an act which actually kills or injures fish or wildlife. Such an act may include significant habitat modification or degradation which actually kills or injures fish or wildlife by significantly impairing essential behavior patterns, including breeding, spawning, rearing, migrating, feeding, or sheltering" (50 CFR 222.102).

Incidental take is defined as "takings that result from, but are not the purpose of, carrying out an otherwise lawful activity conducted by the Federal agency or applicant" (50 CFR 402.02). The ESA at section 7(o)(2) removes the prohibition from any incidental taking that is in compliance with the terms and conditions specified in a section 7(b)(4) incidental take statement (16 U.S.C. 1536). The incidental take statement specifies the effects of any incidental taking of endangered or threatened species. It also provides reasonable and prudent measures (RPMs) that are necessary to minimize the effect of such take, and sets forth terms and conditions with which the action agency must comply in order for the exemption from the take prohibition to be valid.

2.6.1 Amount or Extent of Take Anticipated

As stated in section 2.2, above, MCR steelhead are present in the action area for much of the year. Although project construction is timed to avoid effecting the most vulnerable life histories, MCR steelhead of later life histories will likely experience some of the effects of the proposed action. Therefore, take of MCR steelhead is reasonably certain to occur.

Take in the form of injury or death is likely to result during construction. Take in the form of harm is likely from the other habitat affecting activities. Because fish presence is highly variable numerically and temporally, NOAA Fisheries cannot estimate a specific amount of incidental take of listed fish from this Federal action, despite the use of the best scientific and commercial data available. In situations like this, NOAA Fisheries determines the amount of anticipated take to be "unquantifiable." As a surrogate for estimating the number of fish harmed by the proposed action, NOAA Fisheries has estimated the extent of habitat affected by those activities. The estimated extent of habitat affected from the construction activities (e.g., sediment mobilization, bank armoring, and short term loss of riparian habitat) is approximately 0.5 mile downstream to the confluence with the Columbia River. Thus, exceeding these thresholds during the project would be modified in a way that causes an effect on listed species that was not previously considered, and require reinitiation.

2.6.2 Reasonable and Prudent Measures

The measures described below are non-discretionary. The COE has the continuing duty to regulate the activities covered in this incidental take statement. If the COE or its applicant fails to implement the measures through adherence to the terms and conditions of the incidental take statement, or if the COE fails to retain the oversight to ensure compliance with the terms and conditions, the protective coverage of section 7(o)(2) may lapse.

NOAA Fisheries believes that the following RPMs are necessary and appropriate to minimize the take of ESA-listed fish resulting from the proposed Federal action.

1. The COE will minimize incidental take from in-water construction activities.

2. The COE will minimize incidental take from out of water factors.

3. The COE will minimize incidental take from effects on riparian habitat.

4. The COE will minimize incidental take from effects on instream habitat.

2.6.3 Terms and Conditions

To comply with ESA section 7 and be exempt from the prohibitions of ESA section 9 the COE and/or its applicant must comply with the following terms and conditions, which implement the reasonable and prudent measures described above. These terms and conditions largely reflect conservation measures described as part of the proposed action in the BA and analyzed in the foregoing Opinion. NOAA Fisheries has included them here to ensure that the action agency is aware that they are non-discretionary.

To implement RPM No. 1 (in-water construction) above, the COE shall ensure that:

1.1 All work within the active channel of the Yakima River will be completed between July 1 and September 30, 2004.

1.2 All rock placed at or below the OHWM will be placed individually by excavator arm operating in the dry.

1.3 Riprap used for structure protection shall be clean, angular rock, which shall be installed to withstand the 100-year peak flow.

To implement RPM No. 2 (water quality), the COE shall ensure that all erosion and pollution control measures in the BA are included as special provisions in any SR 224, Van Giesen Road Bank Stabilization project contract.

2.1 Effective erosion control measures shall be in place at all times during the contract. Construction within the project vicinity will not begin until all temporary erosion controls (i.e., sediment barriers and contaminant curtains) are in place.

2.2 All exposed areas will be replanted with a mix of native seed, or revegetated with native riparian vegetation. Erosion control planting will be completed on all areas of bare soil within 14 days of completion of construction.

2.3 Measures will be taken to prevent construction debris from falling into any aquatic habitat. Any material that falls into the river during construction operations will be removed in a manner that has a minimum impact on the riverbed and water quality.

2.4 The Contractor will develop an adequate, site-specific Spill Prevention and Countermeasure or Pollution Control Plan (PCP), and is responsible for

containment and removal of any toxicants released. The Contractor will be monitored by the WSDOT to ensure compliance with this PCP. The PCP shall include the following:

2.4.1 A site plan and narrative describing the methods of erosion/sediment control to be used to prevent erosion and sediment for the Contractor's operations related to disposal sites, borrow pit operations, haul roads, equipment storage sites, fueling operations, and staging areas.

2.4.2 Methods for confining and removing and disposing of excess construction materials, and measures for equipment washout facilities.

2.4.3 A spill containment and control plan that includes: Notification procedures; specific containment and clean up measures which will be available on-site; proposed methods for disposal of spilled materials; and employee training for spill containment.

2.4.4 Measures to be used to reduce and recycle hazardous and non-hazardous waste generated from the project, including the following; types of materials, estimated quantity, storage methods, and disposal methods.

2.4.5 An Erosion and Pollutant Control Manager, who shall also be responsible for the management of the Contractor's PCP.

2.5 Areas for fuel storage, refueling, and servicing of construction equipment and vehicles will be at least 150 feet from the any stream or river channel and all machinery fueling and maintenance will occur within a contained area. Overnight storage of vehicles and equipment must also occur in designated staging areas.

2.6 Equipment refueling and storage areas will have hydrologic function restored (e.g., ripping or subsoiling) in areas where it has been degraded by equipment staging.

2.7 No surface application of nitrogen fertilizer will be used within 50 feet of any water body.

To implement RPM No. 3 (riparian habitat protection), the COE shall ensure that:

3.1 Alteration of native vegetation will be minimized. Where native vegetation will be altered, measures will be taken to ensure that roots are left intact, to enable plant survival and reduce erosion while allowing room to work. No protection will be made of invasive exotic species (e.g., knapweed), although no chemical treatment of invasive species will be used.

3.2 Riparian vegetation removed will be replaced with a native seed mix, shrubs, and trees according to the re-vegetation plan presented in the BA.

3.3 A copy of any riparian re-vegetation monitoring reports submitted to the COE will be forwarded to NOAA Fisheries, Washington State Habitat Office, Lacey, Washington.

To implement RPM No. 4 (instream habitat protection), the COE shall ensure that:

4.1 Large boulders shall be installed along the nearshore bank to provide habitat complexity and refugia habitat for juvenile salmonids.

4.2 Large wood with boles attached shall be incorporated in the rock barb and J-Hook vane construction, or large wood with boles attached shall be strategically anchored with large boulders within the Action Area.

3.0 MAGNUSON-STEVENS FISHERY CONSERVATION AND MANAGEMENT ACT

3.1 Background

The Magnuson-Stevens Fishery Conservation and Management Act (MSA), as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-267), established procedures designed to identify, conserve, and enhance Essential Fish Habitat (EFH) for those species regulated under a Federal fisheries management plan. Pursuant to the MSA:

- Federal agencies must consult with NOAA Fisheries on all actions, or proposed actions, authorized, funded, or undertaken by the agency, that may adversely affect EFH (§305(b)(2));

- NOAA Fisheries must provide conservation recommendations for any Federal or State action that would adversely affect EFH (§305(b)(4)(A));

- Federal agencies must provide a detailed response in writing to NOAA Fisheries within 30 days after receiving EFH conservation recommendations. The response must include a description of measures proposed by the agency for avoiding, mitigating, or offsetting the impact of the activity on EFH. In the case of a response that is inconsistent with NOAA Fisheries EFH conservation recommendations, the Federal agency must explain its reasons for not following the recommendations (§305(b)(4)(B)).

Essential Fish Habitat means those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity (MSA §3). For the purpose of interpreting this definition of EFH: Waters include aquatic areas and their associated physical, chemical, and biological properties that are used by fish and may include aquatic areas historically used by fish

where appropriate; substrate includes sediment, hard bottom, structures underlying the waters, and associated biological communities; necessary means the habitat required to support a sustainable fishery and the managed species' contribution to a healthy ecosystem; and "spawning, breeding, feeding, or growth to maturity" covers a species' full life cycle (50 CFR 600.10). Adverse effect means any impact which reduces quality and/or quantity of EFH, and may include direct (*e.g.*, contamination or physical disruption), indirect (*e.g.*, loss of prey or reduction in species fecundity), site-specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions (50 CFR 600.810).

Essential Fish Habitat consultation with NOAA Fisheries is required regarding any Federal agency action that may adversely affect EFH, including actions that occur outside EFH, such as certain upstream and upslope activities.

The objectives of this EFH consultation are to determine whether the proposed action would adversely affect designated EFH and to recommend conservation measures to avoid, minimize, or otherwise offset potential adverse effects to EFH.

3.2 Identification of Essential Fish Habitat

Pursuant to the MSA, the Pacific Fisheries Management Council (PFMC) has designated EFH for three species of Federally-managed Pacific salmon: chinook (*Oncorhynchus tshawytscha*); coho (*O. kisutch*); and Puget Sound pink salmon (*O. gorbuscha*) (PFMC 1999). Freshwater EFH for Pacific salmon includes all those streams, lakes, ponds, wetlands, and other water bodies currently, or historically accessible to salmon in Washington, Oregon, Idaho, and California, except areas upstream of certain impassable man-made barriers (as identified by the PFMC 1999), and longstanding, naturally-impassable barriers (*i.e.*, natural waterfalls in existence for several hundred years). Detailed descriptions and identifications of EFH for salmon are found in Appendix A to Amendment 14 to the Pacific Coast Salmon Plan (PFMC 1999). Assessment of potential adverse effects to these species' EFH from the proposed action is based, in part, on this information.

3.3 Proposed Actions

The proposed action and action area are detailed above in section 1.2 and 1.3 of this document. The action area includes habitats that have been designated as EFH for various life-history stages of chinook and coho salmon.

3.4 Effects of Proposed Action

As described in detail in section 2.2 of this document, the proposed action may result in short- and long-term adverse effects to a variety of habitat parameters.

1. The proposed action will result in a temporary risk of contamination of waters through the accidental spill or leakage of petroleum products from heavy equipment.

2. The proposed action will result in a short-term degradation of water quality (turbidity) because of instream construction activities.

3. Bank armoring using large rock will permanently displace riverbank (riparian) and riverbed (aquatic) habitat along approximately 400 feet of the Yakima River.

4. Bank armoring, rock barb construction, and J-Hook vane construction will direct high flows to downstream locations where, if unprotected by properly functioning riparian habitat or other forms of bank stabilization, will result in bank erosion.

5. Temporary loss of aquatic insects (a prey base for listed fish) due to the physical loss of existing habitat at the structure placement sites and sedimentation of downstream habitat.

3.5 Conclusion

NOAA Fisheries concludes that the proposed action will adversely affect designated EFH for chinook and coho salmon.

3.6 Essential Fish Habitat Conservation Recommendations

Pursuant to Section 305(b)(4)(A) of the MSA, NOAA Fisheries is required to provide EFH conservation recommendations to Federal agencies regarding actions which may adversely affect EFH. While NOAA Fisheries understands that the conservation measures described in the BA will be implemented by the COE, it does not believe that these measures are sufficient to address the adverse impacts to EFH described above. To minimize the adverse effects to designated EFH for Pacific salmon (contamination of waters, suspended sediment, and habitat alteration), NOAA Fisheries recommends that the COE implement the following: To minimize impacts to habitat identified in section 3.4 No. 1 (contamination of waters);

1.1 A site plan and narrative describing the methods of erosion/sediment control to be used to prevent erosion and sediment for Contractor's operations related to disposal sites, borrow pit operations, haul roads, equipment storage sites, fueling operations, and staging areas.

1.2 Methods for confining and removing and disposing of excess construction materials, measures for equipment washout facilities.

1.3 A spill containment and control plan that includes: Notification procedures; specific containment and clean up measures which will be available on-site; proposed methods for disposal of spilled materials; and employee training for spill containment.

1.4 Measures to be used to reduce and recycle hazardous and non-hazardous waste generated from the project, including the following: Types of materials,

estimated quantity, storage methods, and disposal methods.

1.5 An Erosion and Pollutant Control Manager, who should also be responsible for the management of the Contractor's PCP.

1.6 Areas for fuel storage, refueling, and servicing of construction equipment and vehicles should be at least 150 feet from any stream or river channel and all machinery fueling and maintenance should occur within a contained area. Overnight storage of vehicles and equipment should also occur in designated staging areas.

To minimize impacts to habitat identified in section 3.4, No. 2 (turbidity);

2.1 Effective erosion control measures should be in place at all times during the contract. Construction within the project vicinity should not begin until all temporary erosion controls (i.e., sediment barriers and containment curtains) are in place.

2.2 All rock placed at or below the OHWM should be placed individually by hand or use of an excavator operating from the dry bank.

2.3 All exposed areas should be replanted with native seed mix, or revegetated with native riparian vegetation. Erosion control planting should be completed on all areas within 14 days of completion of construction.

To minimize impacts to habitat identified in section 3.4, No. 3 (habitat alteration);

3.1 Riprap used for structure protection should be clean, angular rock, which should be installed to withstand the 100-year peak flow.

3.2 Alteration of native vegetation should be minimized. Where native vegetation will be altered, measures should be taken to ensure that roots are left intact, to enable plant survival and reduce erosion while allowing room to work.

To minimize impacts to habitat identified in section 3.4, No. 4 (habitat alteration);

4.1 Large boulders should be installed along the nearshore bank to provide habitat complexity and refugia habitat for juvenile salmonids.

4.2 Large wood with boles attached should be incorporated in the rock barb and J-Hook vane construction, or large wood with boles attached should be strategically anchored with large boulders within the action area.

There are no recommendations to minimize impacts to habitat identified in section 3.4, No. 5

(habitat alteration).

3.7 Statutory Response Requirement

Pursuant to the MSA (§305(b)(4)(B)) and 50 CFR 600.920(k), Federal agencies are required to provide a detailed written response to NOAA Fisheries' EFH conservation recommendations within 30 days of receipt of these recommendations. The response must include a description of measures proposed to avoid, mitigate, or offset the adverse impacts of the activity on EFH. In the case of a response that is inconsistent with the EFH conservation recommendations, the response must explain the reasons for not following the recommendations, including the scientific justification for any disagreements over the anticipated effects of the proposed action and the measures needed to avoid, minimize, mitigate, or offset such effects.

3.8 Supplemental Consultation

NOAA Fisheries must reinitiate EFH consultation if the proposed action is substantially revised in a manner that may adversely affect EFH, or if new information becomes available that affects the basis for NOAA Fisheries' EFH conservation recommendations (50 CFR 600.920(l)).

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